

Notes on a collection of small Mammals from
Western Ghats, with remarks on the status of
Rattus rufescens (Gray) and *Bandicota indica*
malabarica (Shaw)

BY

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(With a map)

The present paper is based on material and field observations made during a faunistic survey of the Western Ghats in July-September 1964, by the first and second authors.

The langur, *Presbytis entellus* (Dufresene), in troops and the Ruddy Mongoose, *Herpestes smithi* Gray, were found to be very common between Wai and Mahabaleshwar on Poona-Mahabaleshwar Road, and in the forest around Sinhagarh Fort and Poona, respectively. However, these and a few other small mammals observed in the field have not been incorporated here.

The external and skull measurements (in millimetres) of the specimens are in Table 1.

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SYSTEMATIC ACCOUNT

Family RHINOLOPHIDAE

Rhinolophus lepidus lepidus Blyth, The Horseshoe Bat

MATERIAL: 1 ♀; Khopoli, Kolaba district, 28 September, 1964.

Remarks: According to Ellerman & Morrison-Scott (1951), this bat occurs in 'Central Provinces, Ganges Valley, Kumaon, Bengal.' Apparently a record by Wroughton (1918, p. 574) of this bat from Koyna Valley (Western Ghats) has been overlooked by these authors. More recently, Brosset (1962) has reported it from various localities in Maharashtra.

The specimen was collected with a butterfly net while eating a moth at about 23.00 hours. It had only one pair of mammae (axillary). About 5 mm. area of the skin around each nipple was naked.

TABLE 1
MEASUREMENTS OF SEVEN SPECIES OF SMALL MAMMALS OF WESTERN GHATS

Name of species	Locality	Sex	External						Skull						
			Head and body	Tail	Hind-foot	Ear	Forearm	Condylalobasal length	Inter-orbital width	Bullae	Upper molar tooth row	Zymatic width	Mandibular length		
<i>Rhinolophus lepidus</i> Blyth	Khopoli	1 ♀	51.5	23.5	8	17.5	41.5	—	—	—	—	—	—	—	—
<i>Pipistrellus ceylonicus indicus</i> (Dobson)	Panchgani	1 ♀	50.0	42.0	10.0	13.0	35.6	13.5	3.1	3.2	3.2	9.6	10.1	10.1	10.1
<i>Funambulus palmarum</i> ? bellarius Wroughton ..	Panchgani	1 ♂	159	155	40	16.5	—	38.5	13.2	8.1	8.2	23.1	25.5	25.5	25.5
<i>Funambulus pennanti</i> Wroughton	Wai	2 ♀	147, 149	74, 140	38.5, 40.0	16, 16	—	35.2, 36.1	10.5, 11.1	7.5, 7.8	6.5, 7.0	20.2, 20.9	20.7, 21.5	20.7, 21.5	20.7, 21.5
<i>Rattus rufescens</i> (Gray) ..	Satara	7 ♂	136-166	173-237	29-35	20-25	—	34.2-39.2	5.9-6.4	6.7-7.0	6.1-7.0	17.5-20.0	19.0-21.8	19.0-21.8	19.0-21.8
" "	Satara	8 ♀	141-168	172-234	28-38	21-24.5	—	35.2-39.9	5.0-6.0	5.8-7.2	6.0-6.7	17.0-19.2	20.0-22.1	20.0-22.1	20.0-22.1
" "	Khopoli	2 ♀	146, 189	200, 250	22.5, 33.5	23, 30	—	34.6, 41.5	5.6, 6.5	7.1, 7.7	6.5-7.0	18-20.8	19.6-24.0	19.6-24.0	19.6-24.0
<i>Mus booduga booduga</i> Gray	Near Khopoli	1 ♂	65	63.5	15	10.5	—	18.3	3.1	3.6	3.2	9.1	10.1	10.1	10.1
<i>Bandicota indica malabarica</i> (Shaw)	Kolhapur	1 ♀	281	319	58	32	—	63.2	9.3	9.7	10.4	31.5	39.0	39.0	39.0

Family VESPERTILIONIDAE

Pipistrellus ceylonicus indicus (Dobson), Kelaart's Pipistrelle

MATERIAL: 1 ♀; Panchgani, Satara district, 24 August, 1964.

Remarks: According to Wroughton (1918), Tate (1943), and Ellerman & Morrison-Scott (1951), *P. ceylonicus indicus* occurs in the Malabar coastal area around Mangalore, which is considerably south of the Panchgani-Mahabaleshwar Plateau. The present record, therefore, extends its range further northwards.

Brosset (1962) has mentioned extreme colour variations in *P. ceylonicus chrysothrix* Wroughton, which are also shown by the material of this subspecies present in the Zoological Survey of India. *Pipistrellus ceylonicus indicus* can be easily distinguished externally by the deep brown colour of the body.

In the skull the canine and the second upper premolar are situated close to, but not touching, each other. In other details it agrees with Dobson's (*vide* Tate 1943) description.

Family LEPORIDAE

Lepus nigricollis nigricollis F. Cuvier, The Black-naped Hare

MATERIAL: 1 subad. ♂; Satara (near Ajintara Fort); 2 September, 1964.

Remarks: Individuals of *Lepus n. nigricollis* were common in Western Ghats from Khopoli to Kolhapur. This specimen was caught alive in a low thorny bush on the slopes of Ajintara Fort at Satara. Black-naped hares were frequently observed in thorny bushes in the slopes of hills during day hours.

The specimen was caught in a bag net. It remained alive in the camp for 35 days. It accepted cabbage, green-pea leaves and groundnut as food. Unfortunately, it died due to an accident during transshipment.

Family SCIURIDAE

Funambulus palmarum? bellaricus Wroughton, The Indian or Three-striped Palm Squirrel

MATERIAL: 1 ♂ Panchgani, Satara district; 2 September, 1964.

Remarks: This species is very common at Panchgani. During a fortnight's stay, no other species of this genus came to our notice.

Occipitonasal length (41.8 mm.), and lengths of nasal (13.1 mm.), frontal (=interorbital width) and upper toothrow (Table 1) appear to

be a little more than those given by Ellerman (1963) for *F. p. palmarum*, *F. p. bellarius* and *F.p. robertsoni*, but common to many specimens of the ceylonese subspecies *kelaarti*. As such, this specimen has provisionally, been placed under the above-named subspecies on geographical consideration. It may be mentioned that Ellerman (1963, p. 239) has also recorded one specimen from Bundha, Bombay, provisionally under this subspecies.

***Funambulus pennanti* Wroughton, Northern Palm Squirrel**

MATERIAL: 2 ♀; Wai (alt. c. 614 m.), Satara district; 21 and 28 August, 1964.

Remarks: The Northern Palm Squirrel, *Funambulus pennanti*, was very common at Wai, situated at the base of hills forming the Panchgani-Mahabaleshwar Plateau. Up in the hills, the Three-striped Palm Squirrel, *F. palmarum* was common, but it was not noticed anywhere around Wai at the base.

Moore & Tate (1965), citing from a personal communication of Charles McCann, have also reported similar observations on the two species, occurring within the same geographical range, but in different habitats. The Panchgani-Mahabaleshwar Plateau is situated at a higher elevation and is cooler, moister and more thickly forested than the area around Wai. The forests around Panchgani are of the semi-evergreen type, while those around Wai are deciduous. It was noticed that *F. palmarum* was more arboreal in habits, spending less time on ground. *Funambulus pennanti* on the other hand, was commonly seen on ground, scampering among bushes and hedges, entering holes in the ground, or clambering up and down the neem trees (*Azadirachta indica*) from morning to evening except during the two to three hot hours of midday.

Petrol-tin traps, as devised by Roonwal (1949), were employed for trapping the squirrels, using ground-nut as bait. However, more than once, many individuals escaped from the traps after eating the bait.

Two pairs of mammae (1 pair abdominal, 1 pair inguinal) were noticed in our two specimens.

Family MURIDAE

***Rattus rufescens* (Gray), House Rat**

MATERIAL: 8 ♂, 8 ♀, 9 subad. (5 ♂, 4 ♀), Satara, 2 and 3 September, 1964; 2 ♀, Khopoli, Kolaba district, 27 September and 2 October, 1964.

Remarks: All the specimens from Satara were collected in one wiretrap on two consecutive nights. Following were the trapping records: 2 September, 1964: 6 ♂, 3 ♀, 3 subad. ♂, 2 subad. ♀; 3 September, 1964:

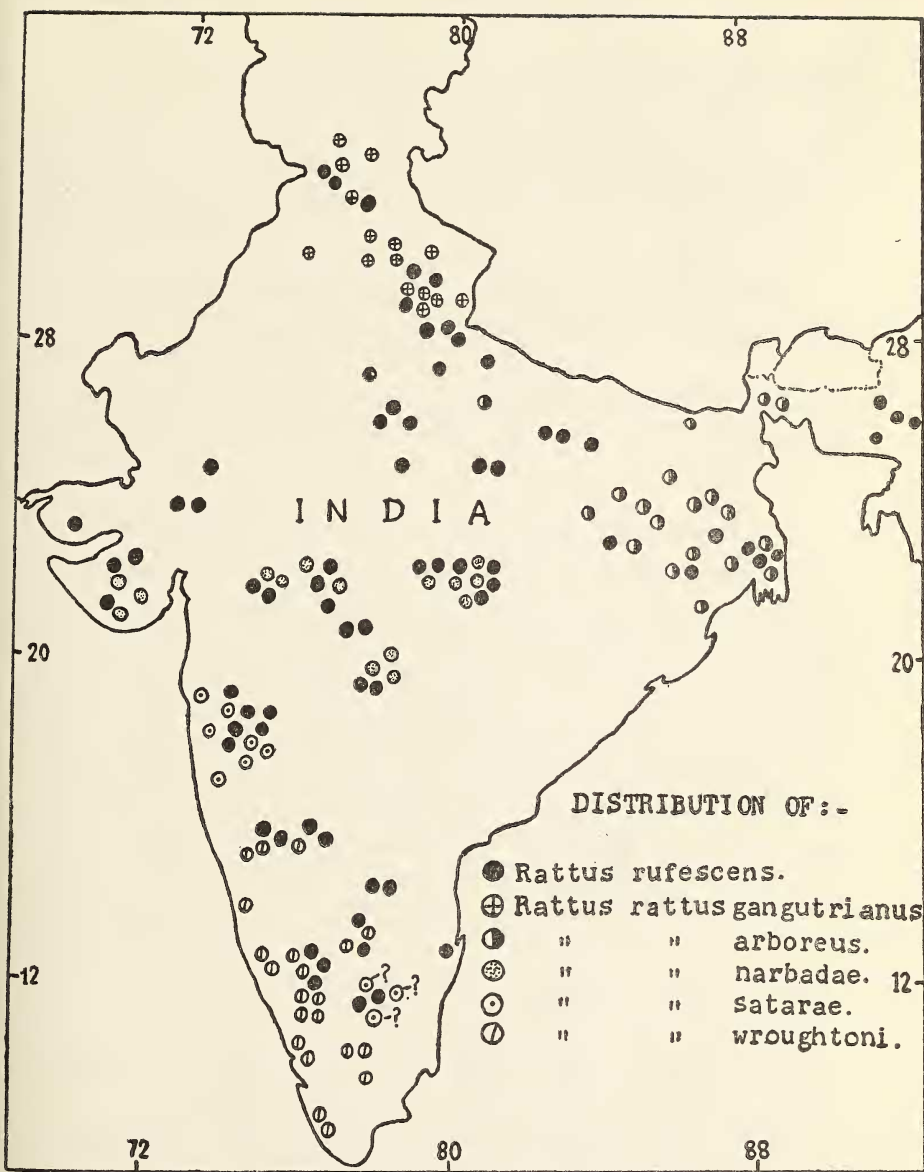
2 ♂, 5 ♀, 2 subad. ♂, 2 subad. ♀. Ghose (1970) has already reported about their cannibalistic habits.

Ellerman & Morrison-Scott (1951) have treated *Rattus rufescens* (Gray) as a subspecies of *Rattus rattus* (Linn.); but we do not agree with their opinion for the following reasons:

One of the basic premises of subspecies concept rests on the allopatric distributions of distinct populations, with zones of intergradation where the two populations meet. If the contention of Ellerman & Morrison-Scott is correct, *rufescens* co-exists as a subspecies with *R. rattus narbadae* Hinton, *R. r. satarae* Hinton, and *R. r. wroughtoni* Hinton in the southern peninsula, and with *R. r. gangutrianus* Hinton and *R. r. arboreus* (Horsefield) in northern hill regions and in eastern India (Map). A study of the distribution of *rufescens* and the five subspecies of *Rattus rattus* indicates that while the latter are allopatric in geographical relationship with each other, the former (*rufescens*) is sympatric with all of them.

Theoretically this is possible in commensal rats which are introduced in new localities through human agencies. However, generally a species or population introduced in a new area is scarcely able to hold its own against the indigenous competitors. The case of *Rattus norvegicus* (Berkenhout) can be cited as an example, which though regularly transported into India by incoming ships, has not been able to spread except in port towns where its stock is periodically replenished. *Rattus rufescens* is a successful rat wherever it is found in India, living side by side with other local populations.

If *rufescens* were a subspecies of *Rattus rattus*, hybrids should have been met with in the areas of overlap with other subspecies. A careful examination of 140 specimens, in addition to the present material, in the Zoological Survey of India fails to reveal any intermediate forms, except that in one adult from Dharwar, Mysore (Regd. No. 12817), there is a small white neck patch and in another subadult from Sakot, Hoshangabad district, Madhya Pradesh (Regd. No. 12753) a white streak is seen from chin to neck. The slight colour differences met with in these two specimens do not appear to be due to intergradation, but seem to be merely individual variations, which are not unknown in other species of *Rattus*. The five subspecies of *R. rattus*, occurring with *rufescens*, are all white-bellied forms with clear line of demarcation between the dorsal and ventral coloration. *Rattus rufescens* is dark-bellied, and is easily distinguishable from these populations because of its distinctive belly colour.



Map of India showing the distribution of the Rats, *Rattus rufescens*, *Rattus rattus satarae*, *R. r. wroughtoni*, *R. r. narbadae*, *R. r. gangutrianus* and *R. r. arboreus* in India. (Based on material in the Zoological Survey of India, Ellerman, 1947, 1963 and Sclater, 1891.)

The sympatric distribution of *R. rufescens*, with complete absence of intermediate forms in zones of overlap with different populations of *R. rattus*, clearly indicates that it is a distinct species.

The present specimens of *R. rufescens* were commensal forms caught in a granary at Satara and from the Rest House at Khopoli (Kolaba District). We have, however, collected this species in the wild at Kisli (Kanha National Park) and Motinala, in Mandla District of Madhya Pradesh; there was no difference in the belly coloration of the wild and commensal individuals.

Mus booduga booduga (J. E. Gray), Little Indian Field Mouse

MATERIAL: 1 ♂; c. 5 km. from Khopoli on way to Khandala Ghat on Bombay Poona Road, Poona District; 2 October, 1964.

Remarks: The specimen was caught by hand from below a stone in the forest, along the slope of the Western Ghats on the way to Khandala from Khopoli.

Bandicota indica malabarica (Shaw), Large Bandicoot Rat

MATERIAL: 1 ♀; Kolhapur, Kolhapur District; 13 September, 1964.

Remarks: Ellerman (1947, 1963) and Ellerman & Morrison-Scott (1951) have treated *Mus malabarica* Shaw as a synonym of *B. i. indica* (Bechstein). Ellerman (1947, p. 366) said: "I am inclined to doubt whether the typical *B. indica* of Wroughton is based on anything but two small individuals, and I feel fairly certain that if enough specimens came to hand from the Nilgiri Hills region the supposed size differences between the two named forms would cease to exist." However, from the material examined by us as well as further data currently available from Ellerman (1963), it appears that *malabarica* and *indica* are distinct subspecies of *B. indica*, the former being larger as shown by the measurements given below:

		Head & body	Tail	Hind-foot	Ear	Occipitonasal length
<i>B. i. indica</i> :	1 ♂	213	252	56	31	50
	* 1 ♀	245	266	45	30	55.5
	* 1 unsexed	—	—	—	—	52.7
<i>B. i. malabarica</i> :	1 ♂	335	338	61	39	—
	6 ♀ ♀	250-335	273-338	54-61	30-39	56-63.2

Wroughton (1908, p. 748) also treated *malabarica* and *indica* separately on the basis of hindfoot-length (*malabarica*: 54-55, *indica*: 48-51),

* Measurements marked with an asterisk are from Ellerman (1963). Other measurements are taken from material collected by us and also from specimens available in the Zoological Survey of India.

to which can now be added the lengths of head and body, tail, ear and occipitonasal length.

ADDITIONAL MATERIAL EXAMINED: *B. i. malabarica*: 1 ♂; Danta, Gujarat. 5 ♀; Devikop, S. Mahratta; Madhavaram, Vontimetta Range, A.P.; Khed, Ratnagiri District, Maharashtra; Sasan, Gir Forest; Virajpet, S. Coorg; Chinturajapalli, Palkonda Hills, E. Ghats.

B. i. indica: 1 ♂, Murumabapalli, Salem.

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